

## **ABSTRACT**

The present invention extends the generalized Lloyd algorithm (GLA) for vector quantizer (VQ) codebook improvement and codebook design to a new linearly-  
5 constrained generalized Lloyd algorithm (LCGLA). The LCGLA improves the quality of VQ codebooks, by forming the codebooks from linear combinations of a reduced set of base codevectors. The present invention enables a principled approach for compressing texture images in formats compatible with various industry standards. New, more flexible compressed texture image formats are also made  
10 possible with the present invention. The present invention enhances signal compression by improving traditional VQ approaches through the integrated application of linear constraints on the multiple pattern and signal prototypes that represent a single pattern or block of signal samples.